Materials Sciences Division
Integrated Safety Management (ISM) Plan

The Materials Sciences Division (MSD) will conduct all of its operations in a manner that protects the health and safety of its employees and guests and that does not endanger the environment. All activities will be carried out in a manner consistent with all applicable Berkeley Lab (LBNL), university, and government agency policies and regulations as described in the Regulations and Procedures Manual (RPM), PUB-3000, and the Operating and Assurance Plan (OAP). This document describes the procedures that will be applied in MSD to insure that these policies are properly implemented.

1.1 Scope of Plan

MSD has a typical annual budget of over $25M and approximately 460 staff, of whom, on average, 40% are guests and 30% are students. As of May, 2001, the Division's scientific staff consists of 45 staff scientist/engineers and senior staff scientist/engineers, 14 postdoctoral fellows, and 53 faculty scientist/engineers. With the exception of two large centers, most of the research is performed by small groups of students, postdocs, and scientists under the direction of a Principal Investigators (PI), most of whom hold joint appointments as UCB faculty. The research groups operate in 5 different buildings at LBNL and 8 buildings on the UC campus.

A large fraction of MSD's employees and guests perform their research on the UCB campus and do little or no scientific work in LBNL laboratories. This work is carried out in accordance with the "Memorandum of Understanding between UCB and LBL Concerning Environment, Health, and Safety Policy and Procedures," dated 6/20/93. Section III of that document describes EH&S oversight activities in this so-called "Appendix J" space: "Where LBL-sponsored activities are conducted in Appendix J space, it is agreed that UCB EH&S personnel will assess compliance with, and with appropriate regulatory agencies will enforce, the standards and regulations applicable to UCB." Therefore, the mechanisms for insuring MSD compliance with LBNL EH&S policies and requirements that are described in this document will apply only to MSD work carried out in LBNL laboratories.

1.2 Accountability

Principal Investigators (PIs) are responsible and accountable to the MSD Division Director for assuring that all activities under their direction are carried out in a safe manner and in accordance with all LBNL EH&S policies and requirements. This responsibility and accountability cannot be delegated. PIs confirm this responsibility at least annually through their signature the MSD Safety Assurance Statement (SAS) which is required for all proposals processed through MSD. The relevant text of this document is given below.

> I have reviewed the impact of the component of the research described in this proposal that will be performed in my laboratories under my direction on the environment and on the health and safety of the staff, students and visitors who will do the work. I certify that proper procedures, equipment, and facilities will be employed and all staff will be appropriately trained to carry out this work in a safe and environmentally benign manner. I further certify that I have personally inspected all of the laboratory space under my

> direction, given a safety presentation to all of the staff, students and visitors under my supervision at least once in the previous year, and that in determining that all the procedures, permits, authorizations, and/or approvals required for my new and ongoing project are in place I consulted with LBNL Pub 3000, the MSD Project Hazard Guide, or the equivalent.

PIs consult with qualified specialists (e.g. the MSD EH&S Coordinator or EH&S Division Staff) to achieve the required expertise about complying with EH&S requirements.

Managers, PIs, and supervisors are responsible for the safety of contracted work by assuring that qualified contractors/service vendors are selected, hazards are identified, and work is performed safely within division space.

1.3 Development and Enforcement of MSD EH&S Policies

MSD maintains a combined Division Safety Committee consisting of the following.

- MSD Group Safety Representatives. Each research group has a designated Group Safety Coordinators. Group Safety Coordinators serve as point-of-contact between the Division Safety Committee and researchers in the division's research groups and are responsible for timely dissemination of policy information provided by EH&S Division and the MSD Division Safety Committee to members of their respective research groups and for the safety awareness of their research group. Typically this person is a senior graduate student or post-doc.
- Building Managers of buildings 62, 66, 72, and 2.
- The MSD Safety Coordinator.
- The MSD EH&S Administrator
- One or more Senior Staff Scientists and/or Senior Faculty Scientists.
- The EH&S Division Liaison to MSD

The committee is responsible for the oversight of MSD safety issues and for developing new MSD EH&S policy. The MSD Safety Coordinator is responsible for maintaining this Division Safety Plan, insuring that routine inspections and the annual Self Assessment are performed, reviewing the annual Self Assessment Report (which shall include an evaluation of compliance with this Division Safety Plan), and promoting general EH&S awareness.

2.1 Scope of Work Authorized

> *MSD conducts basic research in areas of materials sciences consistent with the mission of the Department of Energy. MSD is dedicated to discovering, creating and developing the new materials and phenomena that advance society's understanding of nature, benefit other scientists in their research efforts, and provide the basis for technology development in other institutions, including U.S. industry.*

MSD investigators are trained in materials science, physics, chemistry, and biology and perform laboratory-scale experiments and theoretical modeling of electronic materials, metals, alloys, ceramics, polymers, catalysts, electronic materials and biomolecular materials. Current MSD research programs at LBNL and on the UCB Campus employ table-top lasers, synchrotron end-stations, state-of-the-art electron microscopes, materials synthesis and processing laboratories, machine shops, electronics shops, vacuum systems, wet chemistry labs and other required equipment and facilities.

Research activities proposed in Field Task Proposals/Agreements (FTP/As), Work for Others (WFO) requests, Cooperative Research and Development Agreements (CRADAs), Laboratory Directed Research and Development (LDRD) proposals and other research documents are reviewed for compliance with Laboratory EH&S policies. PIs are responsible both for identifying proposed research activities that have the potential for being hazardous and also for working with appropriate LBNL staff to assure that the research can be pursued safely prior to commencement of experiments or contractual commitment. In addition, each PI prepares EH&S documentation and obtains all required approvals for potentially hazardous or regulated work as defined in Chapter 6 of PUB-3000 prior to commencement of that work. Work of this kind that is currently carried out in MSD is regulated by Activity Hazard Documents (AHDs); MSD has more than 20 AHDs in place as of May, 2001.

2.2 Qualification and Training

It is the responsibility of the PIs to determine and document that each employee or guest under his/her supervision has the requisite qualifications and training to perform his/her work safely. (Administrative supervisors have a similar responsibility for administrative staff.) The MSD policy on training is somewhat more strict than the general LBNL policy and is summarized below.

> All MSD employees and guests who work on the LBNL main site must be fully trained before they can perform laboratory work. The sole exception is participating guests who are here for less than one week; they may do laboratory work without LBNL training but only under the direct supervision of someone who is trained. It is the responsibility of the supervisor to insure that all personnel are properly trained. The MSD Training Checklist supercedes the Job Hazards Questionnaire and lists possible hazards involved in research in MSD laboratories and the required training classes for those hazards. There are three ways to satisfy a training requirement.
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> - By viewing a video of the training class. There are several ways to do this. The MSD Internal web site has streaming video versions of the six most commonly required training courses along with self-tests that ensure that the employee/guest has understood the material. The Building Managers of Bldgs. 62, 72, and 2 have videotapes for loan of the same material. The MSD EHS Administrator (see below) can provide a CD with the streaming video versions and the appropriate viewer software upon request. In any of these cases, the MSD Internal web site has self-test material to help supervisors insure that the employee/guest has learned the training material.
> - EHS Division offers standard classroom training for most of these classes 1-2 times per month. Some other classes, e.g. Laser Safety Training and X-ray Safety Training are offered by appointment. The schedule for these classes is in Currents and on the EHS Division web site.
> - By supervisor exemption. A supervisor may exempt an employee/guest from a required training class if the supervisor certifies on the MSD Training Checklist that the employee/guest has already been trained for a particular hazard by a combination of prior experience (includes training classes taken at other institutions) and/or on-the-job training.
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> The MSD Training Checklist must be completed, signed by the supervisor, and sent (via mail or fax) to the MSD EHS Administrator before an employee/guest is allowed to work in a laboratory. Card key access will not be granted and laboratory room keys will not be issued until this form is completed. Untrained individuals may not work MSD laboratories. The DOE research account of the supervisor may be subject to fines for violation of this policy.

Employees are expected to work safely and to cooperate with MSD EH&S efforts. If they have any questions about the safety or environmental impact of a laboratory activity, they must stop the work and resolve the issue before proceeding. Also, whenever an employee, contractor, or participating guest encounters conditions or practices that appear to constitute an imminent danger (i.e. cause death, serious injury, or environmental harm), they have the authority and responsibility to:

- Alert the affected employee(s) and request that the work be stopped.
- Call the Berkeley Lab emergency telephone number (x7911) and report the situation. LBNL 24/7 Emergency Notification/Contact Team, 486-6999
- Inform the immediate supervisor, EHS coordinator, or manager (if known).

2.3 Integration of EH&S into Project Planning

PIs will incorporate appropriate resource allocations for EH&S-related activities into all research proposals, including costs of safety equipment, permits, training, maintenance, waste disposal, and facilities modifications, unless these costs are covered by LBNL institutional funding sources.

2.3 MSD Use of EH&S Resources

The following resources are allocated to ensure implementation and execution of the MSD Division Safety Plan: MSD Safety Coordinator (0.15 FTE). Baseline support from EH&S Division comes from the areas of Laser and Radiation Safety, Waste Generator Assistance, Industrial Hygiene, Fire Protection, Occupational Safety, and Emergency Services, and Environmental Protection and consists of chemical waste pickup and disposal, training classes, assistance with the annual Self Assessments and other inspections, and advice on the design of new laboratory spaces. It is estimated that 1.00 FTE total of EH&S effort is required for these activities.

3 Mechanisms to Judge Efficacy of ISM Plan

The results of the annual self-inspection are the most important measure of the efficacy of MSD EH&S policies. In addition to the Performance Criteria provided by EH&S, MSD judges its EH&S performance with the following criteria: execution of Self-Assessment inspections on time, all LSADs closed, all SAAs in compliance, all employees and guests properly trained, all AHDs reviewed and approved annually, an OSHA accident rate of as close as possible to zero, and all chemicals properly inventoried in accordance with Laboratory expectations.

4 Signatures

Submitted by

D. S. Chemla
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EH&S Resource Commitment

D. C. McGraw
EH&S Division Director

Accepted

C. V. Shank
LBNL Director